

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A process for production of methanol from a feed stream rich in hydrogen, carbon monoxide and carbon dioxide, comprising the steps of:
 - (a) conversion of the feed stream into a converted process stream comprising methanol, aldehydes and ketones in the presence of a catalyst active in conversion of hydrogen, carbon monoxide and carbon dioxide into methanol;
 - (b) first cooling of the converted process stream to obtain a cooled process stream, the cooled process stream having a temperature of [[to]] 20-200° C[[.]], the temperature being lower than an exit temperature of the converted process stream during the production of methanol from the conversion of the feed stream into the converted process stream of step (a);
 - (c) hydrogenation of the cooled process stream into a hydrogenated process stream rich in methanol and depleted in aldehydes and ketones in presence of a hydrogenation catalyst active in conversion of aldehydes and ketones into alcohols;
 - (d) second cooling of the hydrogenated process stream to a cooled, condensed process stream; and
 - (e) phase separation of the cooled, condensed process stream into a gas phase and a liquid crude methanol.
2. (Original) A process according to claim 1, wherein the converted process stream is cooled to 80-150° C.
3. (Original) A process according to claim 1, wherein the hydrogenation takes place in a separate reactor.
4. (Original) A process according to claim 1, wherein the conversion and the hydrogenation take place in a single reactor.
5. (Original) A process according to claim 1, wherein the hydrogenation takes place in a tubular reactor being cooled by a cold feed stream to the conversion.

6. (Original) A process according to claim 1, wherein the hydrogenation catalyst is a Cu based catalyst.
7. (Original) A process according to claim 6, wherein the Cu content of the hydrogenation catalyst is in the range of 10-95% by weight, preferably 40-70% by weight.
8. (Original) A process according to claim 1, wherein the hydrogenation catalyst is a noble metal based catalyst.
9. (Original) A process according to claim 1, wherein the hydrogenation catalyst is in the form of pellets, extrudates, monolith, catalysed hardware or a powder suspended in a liquid methanol phase.